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(71) Applicant: AT & T WIRELESS SERVICES, INC. [US/US]; 7277 164th Avenue, NE, Redmond, WA 98502 (US).

(72) Inventors: RODERICK, Jordan, M.; 19805 N.E Novelty Hill Road, Redmond, WA 98053 (US). ZHAO, Hong; 15714 N.E. 113th Court, Redmond, WA 98052 (US).

(74) Agent: WIGHT, Stephen, A.; Klarquist Sparkman, LLP, One World Trade Center, Suite 1600, 121 S.W. Salmon Street, Portland, OR 97204 (US).

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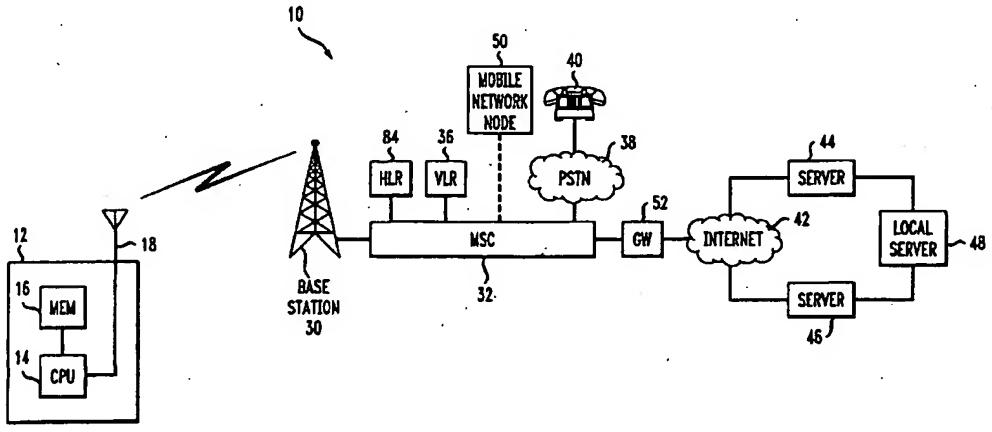

(57) Abstract: Location information for a wireless device is obtained and stored at a network node. The location information is transmitted to the wireless device. The wireless device operates a client engine with a microbrowser or the like to communicate with a web server. The microbrowser and wireless device support the reception of cookies from the web server. The user of the wireless device is presented with an option of adding the location information associated with the wireless device to the cookie. If the user approves, then the location information is added to the cookie information and transmitted to the web server. The web server may then utilize the location information and present content to the wireless device that relates to its location, such as weather, traffic conditions, or local hotel/restaurant services.

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USING WIRELESS COOKIES TO DELIVER NETWORK-BASED LOCATION INFORMATION

RELATED APPLICATION

The present application is related to U.S. Patent Application No. 09/879,351 entitled "Using Wireless Cookies to Deliver Mobile-Based Location Information", filed June 12, 2001. The contents of this related application are incorporated herein.

BACKGROUND OF INVENTION

1. Field of Invention

The present invention relates to cookies and more specifically to a system and method of using network-based location information in wireless cookies to provide location-relevant content.

2. Description of Related Art

Cookies have been commonly used in Internet Client/Server environments. A cookie is a mechanism through which server-side connections can both store and retrieve information on the client side of the connection. Cookies are advantageous to both the user and the server by extending the capabilities of the Internet environment for the user in many different ways. Discussed first is the use of cookies in the personal computer context and then address how cookies in the mobile telephone or wireless device context differ and fail to address the particular needs for users of wireless devices.

Cookies are popular and controversial mechanisms used by web servers. A cookie is a small piece of information that is sent to an Internet browser, such as Microsoft's Internet Explorer®, Netscape®, or a browser within a mobile terminal, along with an HTML page when a user accesses a particular site. The cookie is generally saved on the hard drive of the computer. When the user returns to that

particular site, the stored information in the cookie is sent back to the web server, thus providing information about the user and the computer to the web server.

An Internet "Shopping Cart" is an example of cookie technology in action. As you browse web sites for items to buy, you can "add" items you want to your shopping cart. When you finally want to make a purchase, you can view all of these items together and make your purchase. Other uses for cookies include site personalization, website tracking, targeted tracking, and user ID's.

Depositing cookies on a client computer via the Internet browser is made possible by expanding the capabilities of the hypertext transfer protocol (HTTP). The HTTP is the group of protocol standards that govern the way Web pages, graphics, and other data are transferred across the Internet. Thus every browser on the Internet uses this standard to communicate with the Internet. With each transaction of information, the server sends a small HTTP header telling the receiving end exactly what it's getting. The headers communicate both requests from browsers and responses from servers.

The HTTP standard has limitations. The standard provides for a "stateless" connection. This means that it works like a vending machine where you push a button, and if you gave the correct change, it delivers you a drink. Not much information is passed in the transaction. However, the HTTP cookie increases the intelligence of the information inside the HTTP header. By adding a "Set Cookie..." line to the header, the server can deliver cookie information to the user's browser. The browser saves this information and sends the same back to the web server the next time the same site is visited. The syntax of a set-cookie HTTP response header in the format of a CGI (Common Gateway Interface) script is as follows:

Set-Cookie: NAME=VALUE; expires=Date;
path=PATH; domain=DOMAIN_NAME; secure

The "NAME=VALUE" string is a required field to name the cookie. The "expires=Date" field specifies a date that defines the life of the cookie. At the end of the expiration date, the cookie is no longer stored or provided. The "domain=DOMAIN_NAME" field allows for a comparison of the domain attributes of

the cookie with the Internet domain name of the host from which the URL will be fetched. If there is a match, the cookie checks the "path=PATH" field to see if it should be sent. For example, a domain attribute of "acme.com" will match host names "cars.acme.com" and "flowers.acme.com." The path will specify the subset of URLs in a domain for which the cookie is valid. For example, the path "/foo" would match "/foobar" and "/foo/bar.html." Typically, the path is simply set to "/". The "secure" field, if marked as secure, will cause communications to only be transmitted if the communication channel is a secure one.

There are limitations set on the number of cookies that a client can store at any one time. A client is limited to storing 300 total cookies at a limit of 4 kilobytes per cookie. Each domain or server is limited to 20 cookies. Servers do not expect the clients to be able to exceed these limits; therefore, if a server attempts to add cookies beyond these limits, the oldest cookies are deleted.

Using this cookie system, a "persistent state" can be maintained, although only intermittent communication between the user and the cookie-placing web server is taking place. When cookies are stored after a user completes a web session, and then retrieved for the next session with the same site, the cookie is considered a "persistent cookie."

Because of the many advantages of cookies technology, they are commonly used for personal or laptop computer Internet access. However, with the advance of wireless technologies and wireless Internet access, the use of cookies becomes more difficult. The limitations of the wireless devices and wireless networks has restricted the use of cookies in this context. Wireless devices are significantly smaller and less powerful than laptops or PCs. Their functionality is limited by tiny displays, small keypads, slower processors and less memory. The radio networks that connect wireless devices compare unfavorably with land-line systems in terms of cost, bandwidth, availability and quality of features.

One standard protocol that has attempted to remove some of the wireless deficiencies is the wireless application protocol (WAP). The WAP comprises a

client/server philosophy that requires a microbrowser in the mobile phone and a WAP "Gateway" connected to the mobile network. The WAP Gateway is essentially a piece of middleware that takes information from the web server, processes it, and sends it over the mobile network to the WAP client. In addition to mobile phones having decreased functionality when compared with laptop or table top computers, as discussed above, WAP clients (e.g., mobile phones) require a larger screen size and more memory to handle the WAP stack and are more expensive than other mobile phones.

According to the WAP standard, the client device (phone, pager, PDA or other) initiates a request for content, and the message is sent over the wireless network to a WAP gateway. The gateway converts the message from the wireless format to an Internet-compatible format and forwards the request to the web server. The web server receives the request and transmits the content to the gateway. The gateway then encodes the content back into the wireless format and sends it over the wireless network to the user's device.

The WAP protocol has been developed by industry participants and the protocol stack may be compared to the OSI model. The Wireless Application Environment (WAE) provides an interoperable platform with microbrowser capabilities including the ability to display WML-encoded content. The Wireless Session Protocol (WSP) provides a connection-oriented service that enables a server to recognize a group of client requests as belonging to the same session. The Wireless Transaction Protocol (WTP) provides services for sending messages and for a send-receive pair of messages. The Wireless Transport Layer Security (WTLS) provides data integrity, privacy and authentication services over the wireless network. The Wireless Datagram Protocol (WDP) provides an interface for the above-mentioned stack layers so they can operate independently of network type.

The ability of WAP to support the use of cookies is limited. As an alternative approach to cookies, some WAP application use indexes in the URL. Because presently you can only provide from the client device an IP address (and not cookies with personalization information), the approach to identify a user between connections

is to construct a URL that includes the user's authentication information. Allowing a user to bookmark that URL within their device provides a small level of cookie-like personalization.

One of the WAP layers that does provide some cookie support is the WAP Wireless Session Protocol, mentioned above. This portion of the protocol is based on using HTTP headers and therefore makes it possible to transmit cookie information to wireless clients if the clients support receiving the header information. The dearth of support for persistent cookies for session management is due to client-side deficiencies rather than the WAP WSP layer itself. Few client systems (wireless devices) are able to support handling the cookie HTTP header information or have the ability to store the cookie information in a persistent manner on the mobile phone.

Other server-side applications perform "web clipping" to reduce the standard amount of web information required to enable communication with mobile clients. These web-clipping applications require a web-based back end to serve the dynamic content and a client-side application that operates on the mobile phone or personal digital assistant, such as the Palm VII.

In addition to WAP discussed above, another server-side application is called the Common Gateway Interface (CGI). This application suffers from similar deficiencies in supporting cookie technology. When using CGI, the pages served to the client must use a restricted subset of the Hypertext Markup Language (HTML) 3.2, which removes the ability to deliver content such as style sheets, image maps, frames and cookies.

One of the advantages of cookie technology for laptop or desktop computers is the advantage of personalizing the Internet surfing experience. The personalization may take the form of building a profile of the user as a surfer based on the sites visited and the products purchased. Presently, the needs of the user for personalized services when browsing the Internet using a mobile telephone or other wireless device is very different. The number of web sites that can be browsed is dramatically less, the amount of information received is reduced, and there are other considerations – such as the

mobility of the user – that are not addressed by present cookie technology, if it is available at all for the particular wireless device.

A faster version of WAP is called WAPlite. This was developed as having the full features of WAP but designed primarily to be fast and to scale from several users to several thousand users. In WAPlite, the mobile device or phone can be configured to enable the use of HTTP session cookies. In this case, the cookie is only stored and used for a particular session and is not saved between sessions. Thus, many of the benefits of cookies are lost by the use of session cookies. WAPlite does not support persistent cookies.

The personalization needs for wireless devices differ from those for the standard personal computer. Presently, only sparse use of wireless cookies is available for wireless devices. Both the wireless protocol, gateway and wireless device must be capable of receiving, delivering and stored cookies to realize the advantages of cookies. Further, the present cookie technology, if available, does not address the particular mobile needs for the user of a wireless device. Given the small screen size, reduced amount of information available, and mobility of the user of a wireless device with Internet capability, the present cookie technology fails to provide such a user with the full capability of personalizing the user's experience. What is needed in the art is the ability to use cookie technology to provide personalization for wireless device users.

SUMMARY OF THE INVENTION

The present invention addresses the deficiencies in the art and enables wireless cookies to provide pertinent information to wireless device users. An important element used in wireless networks is location information for each wireless device. As wireless devices move from cell to cell, and from a home-based network to a roaming network, the location information for that wireless device is communicated between networks. The location information enables a service provider to deliver preferred information to the mobile user, based at least in part on the location of the mobile user.

Location information for a wireless device may be obtained either through network-based technology or mobile-based technology. Network-based location information is stored, managed and collected in a database associated with the network. The mobile-based technology is discussed in further detail in the related patent application referenced above and incorporated herein.

The present invention enables location information to be provided as part of the cookie mechanism to an Internet service provider in order to generate location-based services to the mobile user. These services may include, for example, weather information, hotel information and traffic in the city where the wireless device is located.

The invention comprises a wireless communication system having a network-based location information system. A wireless device associated with the wireless communication system is capable of communicating with the Internet via a microbrowser or the like.

In another aspect of the invention, content is delivered to the wireless device using the short-message service (SMS). In this case, rather than a browser, the mobile device has short-message service capability. Using a proxy server, the user will have a type of Internet access but it will not be browser-based. Therefore, location-based requests and services may also be delivered through a SMS service rather than a standard browser. A cookie scenario applies to the SMS system as long as the application was obtained and delivered or fetched from an Internet delivery content provider. Using the location information from the proxy server, the content provider can push location-based content to the wireless device using the SMS system. Thus, the mobile device according to the present invention may receive the information via a browser or a short-message service capable phone.

The wireless device and microbrowser are capable of receiving cookies. The cookies may be formatted for a wireless protocol or modified in a variety of ways as may be known in the art. The wireless communication system will transmit and update the location information to the wireless device for storage in a memory unit.

When the microbrowser is operated to access an Internet site, the user will be asked for approval to attach location information to the cookie. If the user approves, the location information will be added to the cookie by the network. Then, as the cookie information is transmitted to the wireless web server, the location information may be used to deliver more targeted information that is relevant to a mobile user.

A method according to another embodiment of the present invention comprises transmitting location information from a wireless network to a wireless device, storing the location information in the wireless device, requesting permission from a user to add the location information to a cookie. If permission is granted, the method further comprises adding the location information to the cookie, transmitting the cookie to a web server, and delivering content to the wireless device based, as least in part, on the contents of the cookie.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention may be best understood with reference to the attached drawings and associated description, of which:

FIG. 1 shows an exemplary system according to the first embodiment of the present invention; and

FIG. 2 illustrates an exemplary method according to the second embodiment of the present invention.

DETAIL DESCRIPTION OF THE INVENTION

The first embodiment of the invention may be understood with reference to FIG. 1, which illustrates an exemplary wireless communication system 10 having a wireless device 12. The wireless device 12 may be any form of wireless device such as a mobile phone, personal digital assistant (PDA), palm pilot, or similar type of wireless device. The wireless device 12 has a processor 14, a memory unit 16 and an antenna 18. Other components are also part of the wireless device 12 but are not shown. The wireless device 12 is capable of communicating with the Internet or web servers 44, 46

and therefore has the necessary amount of memory in the memory unit 16 and processing abilities to operate a microbrowser (not shown) or other client engine for establishing a communication link to the Internet 42 or web servers 44, 46.

The wireless device 12 communicates through an air interface with a base station 30 and a mobile switching center (MSC) 32. A home location register (HLR) 34 and visitor location register (VLR) 36 are shown as communicating with the MSC 32. Other network components may be used depending on the network protocols, and any such additional hardware components are known to those of skill in the art.

The wireless communication system 10 of FIG. 1 is not limited to any specific protocol. For example, this may be a global system for mobile communications (GSM) based system, code divisional multiple access (CDMA), time divisional multiple access (TDMA), EDGE or Third Generation Wireless System. The particular protocol used is irrelevant to the present invention.

The present invention is described in the context of a circuit-switched network scenario by example. This invention also applies to a packet-switched network using a similar methodology, as would be understood by those of skill in the art. Further, other types of networks may also be employed and the present concepts are applicable to any future networks. In these cases, the MSC 32 can be replaced by a packet router, 3G network element, etc. Therefore, although the examples here are explained in the context of a circuit-switched network, the invention is clearly applicable to other networks, such as packet-switched networks.

Returning to FIG. 1, the MSC 32 may be a home network node or a roaming network node for the wireless device 12. The MSC 32 represents the network-processing portion of the system for the base station 30 presently servicing the wireless device 12. For example, if the MSC 32 is servicing a roaming wireless device 12, then a communication link will exist between the MSC 32 and the home network node 50 to provide authentication and login information, as is known in the art.

The MSC 32 communicates through a public switched telephone network (PSTN) 38 or a private network with a telephone 40 for communicating between calls.

The MSC 32 also communicates through a packet-switched network (the Internet) 42 with web servers 44, 46. A gateway 52 provides the necessary functionality for converting requests from the wireless device 12 from the wireless format to an Internet compatible format and forwarding the requests to the web servers 44, 46. The web servers 44, 46 receive the requests and transmit content back to the gateway 52. According to one aspect of the present invention, the wireless protocol supports transmitted cookies to the wireless device 12 through the use of its Wireless Session Protocol or Wireless Transaction Protocol stack layers. The hardware used for the web servers 44, 46 is known to those of skill in the art and therefore the details are not provided herein.

The web servers 44, 46 may include databases with content to transmit to the wireless device 12. Web servers 44, 46 may also communicate with a local services server 48 that provides data such as weather reports, traffic conditions, hotel accommodations or other information that is localized to the present position of the wireless device.

According to the present invention, the network node MSC 32 includes location identification means. There are currently many ways to collect mobile location information from a mobile network. Although several useful location-identification means are discussed, the invention is not limited to any specific means such as triangulation or time delay and angle of arrival or a combination of these two. The location information collected by the network can be stored in any network node or in an HLR if the mobile is being served by a home network or stored anywhere in the roaming network. The MSC 32 will monitor and store data associated with the present location of the wireless device 12. For example, in the GSM protocol, the MSC 32 may update location information on several occasions, such as when the wireless device 12 changes location, on a periodic basis, with an attach or detach signal or when the wireless device 12 is turned on. When the location is updated, such as when the wireless device 12 powers on, its new location is transmitted to the MSC 32 during the registration process.

With the location information stored at the MSC 32, the location information may be transmitted to the wireless device 12 and stored in its memory 16. The location identification information may be in any known format including details such as city, state, country, or even more detailed location information within a city.

The MSC 32 communicates with a public switched telephone network (PSTN) 38 for telephone voice calls. The packet-switched network 42 shown in FIG. 1 may also represent a public packet-switched network or any other communication network that provides a data connection between the MSC 32 servicing the wireless device 12 and a web server 44 or 46. The web servers 44, 46 are shown as communicating with the packet switched network 42 and a local services server 48.

According to the protocols used by the web servers 44, 46 to communicate with the wireless device 12, the web servers 44, 46 will download a cookie to be stored in the memory 16 of the wireless device 12. The cookie may be similar in structure to those used for laptop or desktop computers, or it may be in a different HTTP format. The microbrowser client engine operating on the wireless device 12 will store the cookie in a similar manner to that accomplished on a desktop PC.

The location information stored in a network node such as the MSC 32 is also transmitted to the wireless device 12. Preferably, the user, when "surfing" the Internet by communicating with a host such as one of the web servers 44, 46 will be asked whether he or she wishes to add the stored location information in the cookie. Cookies are controversial because they provide information about the user to a web server, often without the user's knowledge. Therefore, it is preferable to inquire and receive permission to add location information to the stored cookie on the wireless device 12.

In one aspect of the invention, the request for permission is directed to the user from the web server 44, 46. In another aspect of the invention, the wireless device 12 is operable to provide the request to the user and receive the permission or denial. If permission is granted, the wireless device 12 adds the location information to the cookie. The cookie format may have to be modified in the wireless context to be able to receive the location information such that when the web server 44, 46 receives the

cookie back, it will recognize the location information found in the cookie. Similarly, other data units that may not be termed "cookies" may also be used. If such data units are employed, then the present invention is contemplated to be applicable for those data units.

Using the location information found in the cookie, the web servers 44, 46 can more adequately provide content directed to the user's needs, which are likely to be associated with his or her location. For example, according to the present invention, a user can take her cell phone 12 from the United States to England. Once in England, the location information is transmitted to the cell phone 12 and, upon permission by the user, the location information may be added to the cookie. As the user is then surfing the Internet using the cell phone 12, the location information is provided to the web server 44, 46 through the cookie. Restaurants, weather information, traffic information, or any other kind of location-sensitive information may then be narrowly tailored for the user. The information or location-sensitive content may be drawn from databases associated with the web server 44, 46 or may be drawn from a separate server 48. A web server 44 or 46 chooses content based on a correlation between the content sent and the location information received via the cookie. The content transmitted from the web server 44, 46 to the wireless device 12 may be based, at least in part, on the cookie information, which includes (if the user approves) the location information.

The second embodiment of the invention relates to a method of transmitting content from a web server to a wireless device using location information associated with a cookie. The method according to the second embodiment is functional on a system similar to that shown in FIG. 1, including a wireless device capable of operating a client engine such as a microbrowser for establishing communication through a wireless communication system to web servers operating server engines for communicating with wireless devices. A gateway performs the necessary conversion of wireless requests to Internet-compatible requests and forwards the requests through the Internet or other network to web servers. The content returned is converted from the

Internet-compatible format into a wireless format and forwarded to the wireless device. The wireless application protocol and wireless device are assumed to support cookies.

As shown in FIG. 2, the method comprises receiving location information at a network node (100). In this embodiment, the network node – such as a mobile switching center or other component in the network – will operate, manage and store the location information for knowing where the wireless device is located and for updating the location information as needed. The location information is transmitted to the wireless device (102). The next step may be optional but is included in FIG. 2, which is requesting permission to add the location information to a cookie (104). It is assumed that before step (102) executes, the wireless device has established communication with a web server that operates a protocol supporting cookies. The request for permission may originate from the web server or may be triggered at the wireless device upon the reception of a cookie from the web server.

If step (104) is used, then the user must respond to the inquiry and decide whether to allow the location information to be added to the cookie. This is represented in step (106). The request and response from the user may be accomplished via the display and push button response, or by voice recognition commands, or other means. If the user does not grant permission, then the cookie is transmitted to the web server without the location information included (108) and the web server responds with content as personalized as is available with the cookie information sent.

If the user grants permission, then the process continues to add the location information to the cookie data (110). This may involve defining a new field within the cookie and providing formatted information to identify the location of the wireless device. The cookie is then transmitted to the web server (112) according to the normal process of using the cookies for personalizing the wireless web experience. Finally, the content delivered to the wireless device from the web server may be modified or tailored to the wireless device according to the location of the device as indicated by the cookie information (114). This may involve correlating data in a database with the location information and providing data such as weather, shops, hotels, traffic, news, or

other information that is of local interest according to the current location of the wireless device.

In this manner, the wireless device can receive content more personalized and relevant to its operation and mobility than could otherwise be gained by using standard cookie data.

In some wireless scenarios, to compensate for the reduced capability of wireless devices to accept and store cookies and improve radio resource usage, a proxy server has been introduced. A proxy server will intercept and store cookies sent from the web servers. The proxy server not only stores the cookie but information regarding the web server, such as its URL, and an identification identifying the user terminal. Then, the next time the user accesses the same web server, the cookie is drawn from the proxy server and included in the request message so that the server is accessed with a copy of the cookie as desired. Another aspect of the present invention is to enable the location information to be added to the cookie that is stored on the proxy server. This may be accomplished in several ways. First, the network node storing the location information may transmit the location information not only to the wireless device but also the proxy server. The same permissions may be used to provide the user a chance to prevent the location information from being added to the cookie.

In another aspect of the invention in the proxy server scenario, after permission is given by the user, the location information in the wireless device is added to the request message with the cookie as they are transmitted to the web server for processing. Therefore, when cookies are intercepted and stored on a proxy server, the present invention nevertheless enables the location information to be added to the cookie before it is transmitted to the web server so that relevant location-based content can be delivered to the wireless device by the web server.

In another aspect of the invention related to the use of a proxy server, content is delivered to the wireless device using the short-message service (SMS). In this case, rather than a browser, the mobile device has short-message service capability. Using a proxy server, the user will have a type of Internet access but it will not be browser-

based. Location-based requests and services may be delivered through a SMS service rather than a standard browser. A cookie scenario applies to the SMS system as long as the application was obtained and delivered or fetched from an Internet delivery content provider. Using the location information from the proxy server, the content provider can push location-based content to the wireless device using the SMS system. Thus, the mobile device according to the present invention may receive the information via a browser or an SMS capable phone.

Although the above description may contain specific details, they should not be construed as limiting the claims in any way. Other configurations of the described embodiments of the invention are part of the scope of this invention. For example, there may be other wireless protocols used and developed in the future for communicating between servers and wireless clients. Any of these protocols that use cookies or technologies similar to cookies would be covered as within the contemplated scope of this invention. Furthermore, two cookie systems have been discussed, one in which cookies are stored on the wireless device and one using a proxy server to store cookies. Other ways of storing cookies or cookie-like data may also be used in the wireless context, given the storage and transmission restraints. Therefore, as other developments or capabilities using cookie technologies are developed, the present invention contemplates that adding location information from the network to the cookie data is within the scope of this disclosure. Accordingly, the appended claims and their legal equivalents should only define the invention, rather than any specific examples given.

CLAIMS

We claim:

1. A wireless communication system for providing network-based location information, the wireless communication system comprising:

a wireless device capable of communicating with a web server and having a microbrowser, the microbrowser being capable of receiving cookies; and

a memory unit in the wireless device, wherein location information is transmitted from the network and stored in the memory unit, wherein the web server communicates with the wireless device and transmits cookies to the wireless device, wherein when a user operates the microbrowser to access the web server, the user is asked for approval to attach the location information to the cookie.

2. The wireless communication system of claim 1, wherein if the user approves of attaching the location information to the cookie, the location information is added to the cookie.

3. The wireless communication system of claim 2, wherein as the web server receives the cookie, the web server delivers content to the wireless device based at least in part on the location information contained in the cookie.

4. A wireless communication device associated with a wireless communication system that manages network-based location information, the wireless communication device comprising:

a processor for operating a microbrowser capable of communicating with a web server and capable of receiving a cookie; and

a memory unit in the wireless device, wherein the location information is transmitted from the wireless communication system and stored in the memory unit, and wherein the wireless device adds the location information to the cookie.

5. The wireless communication device of claim 4, wherein before the wireless device adds the location information to the cookie, the user responds to a request from the web server for approval to add the location information to the cookie.

6. The wireless communication device of claim 5, wherein as the web server receives the cookie including the location information, the web server delivers content to the wireless device based at least in part on the location information contained in the cookie.

7. A wireless device associated with a wireless communication system that manages network-based location information, the wireless communication device comprising:

a processor for operating a microbrowser capable of communicating with a web server and capable of receiving a cookie; and

a memory unit in the wireless device, wherein the location information is transmitted from the wireless communication system and stored in the memory unit, and wherein after approval from a user, the wireless device adds the location information to the cookie.

8. The wireless device of claim 7, wherein if the user does not provide approval, the location information is not added to the cookie.

9. A wireless communication system having network-managed network-based location information, the wireless communication system comprising:

a wireless device capable of communicating with a web server and having a microbrowser, the microbrowser being capable of receiving a cookie; and

a memory unit in the wireless device, wherein location information is transmitted from the network and stored in the memory unit, wherein the web server communicates with the wireless device and transmits cookies to the wireless device, wherein upon approval from a user, the location information in the memory unit is added to the cookie.

10. The wireless communication system of claim 9, wherein the cookie is transmitted to the web server and the web server delivers content to the wireless device based at least in part on the location information in the cookie.

11. The wireless communication system of claim 10, wherein the content delivered to the wireless device relates to services local to the wireless device.

12. The wireless communication system of claim 10, wherein the content delivered to the wireless device relates to weather information local to the wireless device.

13. The wireless communication system of claim 10, wherein the content delivered to the wireless device relates to traffic information local to the wireless device.

14. A method of transmitting content from a web server to a wireless device using location information in a cookie, the wireless device being capable of operating a browser to communicate with a web server, the method comprising:

receiving location information associated with the wireless device at a network node;

transmitting the location information from the network node to the wireless device;

requesting permission from a user to add the location information to a cookie;

if permission is granted, adding the location information to the cookie;

transmitting the cookie to the web server; and

delivering content to the wireless device based at least in part on the location information in the cookie.

15. The method of transmitting content from a web server to a wireless device using location information in a cookie of claim 14, wherein the content delivered to the wireless device is associated with service local to the wireless device.

16. The method of transmitting content from a web server to a wireless device using location information in a cookie of claim 14, wherein the content delivered to the wireless device is associated with weather information local to the wireless device.

17. The method of transmitting content from a web server to a wireless device using location information in a cookie of claim 14, wherein the web server performs the step of requesting permission from a user to add the location information to a cookie.

18. A method of communicating between a wireless device and a web server, the wireless device capable of receiving a cookie from the web server, and the wireless device associated with a wireless network that manages location information associated with the wireless device, the method comprising:

transmitting location information from the network to the wireless device;

adding location information to a cookie associated with the web server; and

delivering content to the wireless device based at least in part on the contents of the cookie.

19. The method of communicating between a wireless device and a web server of claim 18, further comprising:

before adding location information to the cookie, requesting permission from a user.

20. The method of communicating between a wireless device and a web server of claim 18, wherein the content delivered is associated with services local to the wireless device.

21. The method of communicating between a wireless device and a web server of claim 18, wherein the content delivered is associated with weather information local to the wireless device.

22. The method of communicating between a wireless device and a web server of claim 18, wherein the content delivered is associated with traffic conditions local to the wireless device.

23. A method of communicating between a wireless device and a web server, the wireless device capable of receiving a cookie from the web server, and the wireless device associated with a wireless network that manages location information associated with the wireless device, the method comprising:

transmitting location information from the network to the wireless device;

requesting permission from a user to add location information to a cookie associated with the web server;

if permission is granted from the user, adding location information to the cookie;

transmitting the cookie to the web server; and

delivering content to the wireless device based at least in part on the contents of the cookie.

24. A method of transmitting content from a web server to a wireless device using location information in a cookie, the cookie being stored on a proxy server, the method comprising:

receiving location information associated with the wireless device at a network node;

transmitting the location information from the network node to the wireless device;

adding the location information to the cookie before it is transmitted to the web server from the proxy server;

transmitting the cookie to the web server; and

delivering content to the wireless device based at least in part on the contents of the cookie.

25. The method of claim 24, wherein the content is delivered to the wireless device using a short-message serve.

26. A wireless communication system having network-managed network-based location information, the wireless communication system comprising:

a wireless device capable of communicating with a web server;

a proxy server receiving and storing cookies associated with the wireless device; and

a memory unit in the wireless device, wherein location information is transmitted from the network and stored in the memory unit, wherein the web server communicates with the wireless device and transmits cookies to the proxy server, and wherein when a user operates the wireless device to access the web server, the user is asked for approval to attach the location information to the cookie.

27. The wireless communication system of claim 26, wherein when the user access the web-server, location information is obtained from the wireless device and proxy server, and location-based information is transmitted to the wireless device via a short-messaging service.

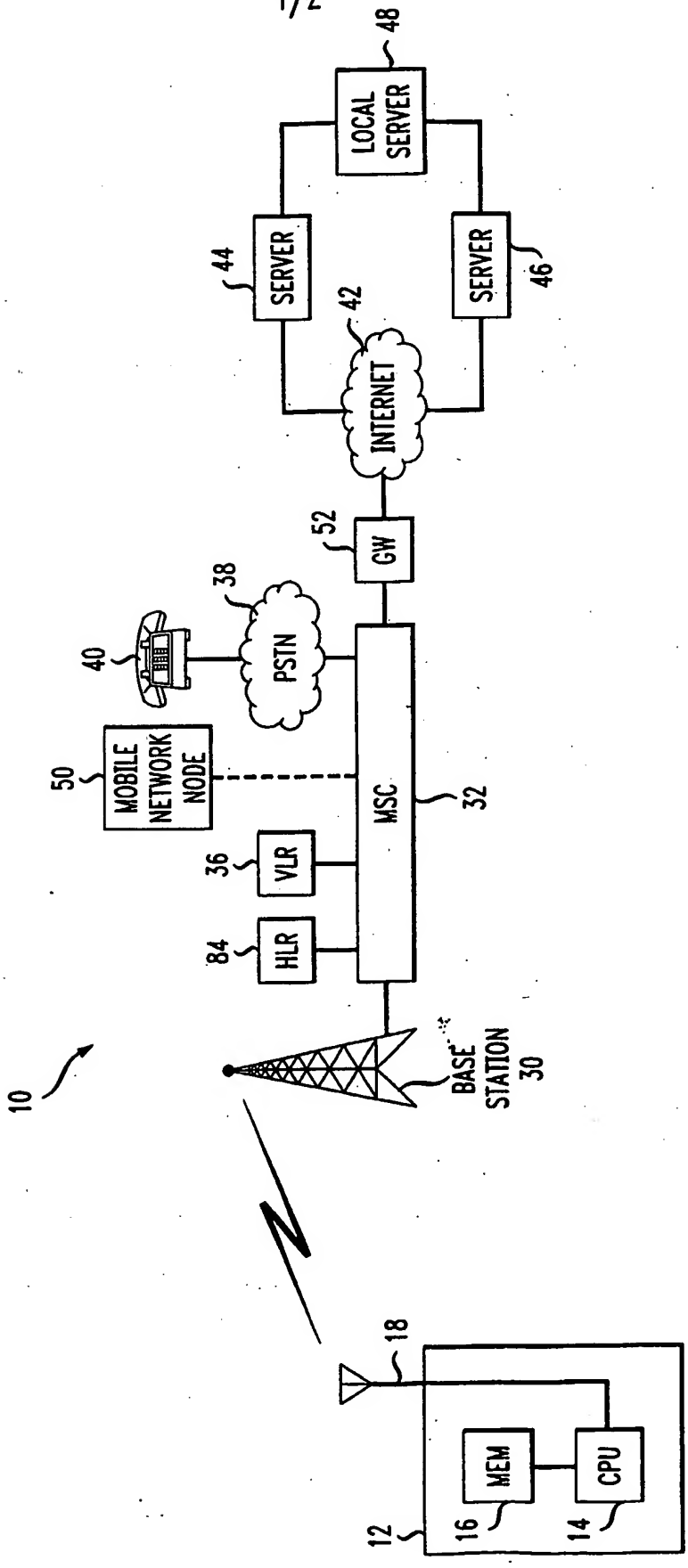
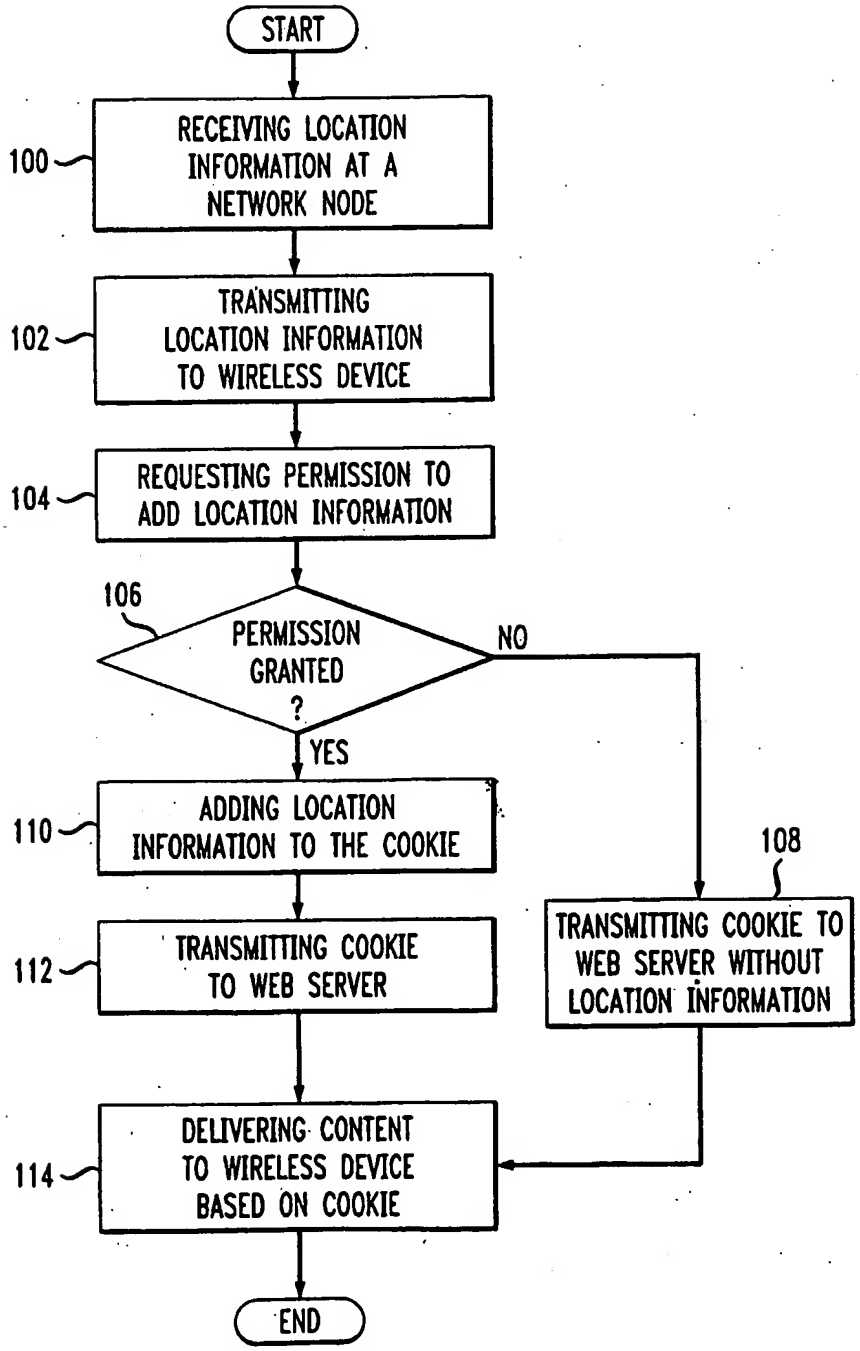

10
BASE STATION 30
MSC 32
VLR 36
HLR 84
MOBILE NETWORK NODE 50
PSTN 38
40
GW 52
INTERNET 42
SERVER 44
SERVER 46
LOCAL SERVER 48
18
MEM 16
CPU 14
12

FIG. 1

FIG. 2


START
RECEIVING LOCATION INFORMATION AT A NETWORK NODE
100
TRANSMITTING LOCATION INFORMATION TO WIRELESS DEVICE
102
REQUESTING PERMISSION TO ADD LOCATION INFORMATION
104
106
PERMISSION GRANTED ?
NO
YES
ADDING LOCATION INFORMATION TO THE COOKIE
110
TRANSMITTING COOKIE TO WEB SERVER
112
108
TRANSMITTING COOKIE TO WEB SERVER WITHOUT LOCATION INFORMATION
DELIVERING CONTENT TO WIRELESS DEVICE BASED ON COOKIE
114
END

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 02/18611

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04L29/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04L H04Q G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00 41090 A (DEVORE KRISTI ;DURST KELLY (US); EARY MATT (US); FISHER ED (US); K) 13 July 2000 (2000-07-13) page 18, line 6 - line 8 page 18, line 17 - line 20 page 19, line 1 - line 10 page 33, line 11 - line 18 page 71, line 3 -page 72, line 13 page 80, line 7 - line 15 page 80, line 20 - line 22 figure 1	1-26
Y	--- -/--	27

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
5 September 2002	13/09/2002

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Tous Fajardo, J

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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